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ABSTRACT

Application of computer technology to psychiatric outcome measurement offers the promise of coping with increasing demands for extensive patient interviews repeated longitudinally. Described is the development of a cost-effective multi-dimensional tracking device to monitor psychiatric functioning, building on a previous local computer interview system. This new instrument incorporates items covering: (1) demographics; (2) treatment during the previous week; (3) sections of the Diagnostic Interview Schedule covering depression, mania, schizophrenia, alcohol abuse, and drug abuse; (4) social functioning, including negative social behaviors, leisure activities, social engagement, and social support; (5) instrumental functioning, including employment, self-care, and residential self-sufficiency. Follow-up interviews use computer branching to quickly cover all of the same areas. An interviewer conducts the interview at a terminal, and follow-ups may be conducted by telephone. Pilot study results indicate the feasibility of the procedure, which may be used to distinguish varying temporal patterns, predict relapse, and examine treatment effects longitudinally. (Author/PN)

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A COMPUTER INTERVIEW FOR MULTIVARIATE MONITORING OF PSYCHIATRIC OUTCOME

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ABSTRACT

Application of computer technology to psychiatric outcome measurement offers the promise of coping with increasing demands for extensive patient interviews repeated longitudinally. The authors have begun the development of a cost-effective multi-dimensional tracking device to monitor psychiatric functioning, building on a previous local computer interview system. This new instrument incorporates items covering: (a) demographics, (b) treatment during the previous week, (c) sections of the Diagnostic Interview Schedule covering depression, mania, schizophrenia, alcohol abuse, and drug abuse, (d) social functioning, including negative social behaviors, leisure activities, social engagement, and social support, (e) instrumental functioning, including employment, self-care, and residential self-sufficiency. Follow-up interviews make use of branching to quickly cover all of the same areas. An interviewer conducts the interview while sitting at a terminal, and follow-ups may be conducted by telephone. Pilot study results indicate the feasibility of the procedure, which may be used to distinguish varying temporal patterns, predict relapse, and examine treatment effects longitudinally.

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In psychiatric evaluation research, it is frequently necessary to assess patient functioning on an extensive set of dimensions, due to the complexity of outcome patterns (Anthony, Cohen & Vitale, 1978; Ciarlo, 1981; Hargreaves & Atkisson, 1978; Schwartz, Myers & Astrachan, 1975; Stevenson, 1982). Some of the most interesting questions regarding treatment effects can best be answered by monitoring patterns of symptoms and functioning over time (Grossman, Harrow, Fudala, & Meltzer, 1984; Stout, 1984). In addition, with the development of more precise diagnostic interview systems (e.g. the Diagnostic Interview Schedule) for assigning DSM-III diagnoses, psychiatric researchers have been eager to incorporate thorough diagnostic interviews in outcome research (Robins, Helzger, Croughan, and Ratcliff, 1981; Robins, Helzer, Ratcliff, & Seyfried, 1982). All of these factors have led to cumbersome, lengthy data collection procedures in the search for more precise and thorough answers to questions about treatment impact for major psychiatric disorders.

Background

Application of computer technology to psychiatric outcome measurement offers one promising response to the problems noted above. Actually, the computer has been incorporated into psychiatry in a dazzling variety of ways, functioning as clinical information system, diagnostician, surrogate therapist, and business office jack-of all-trades as well as patient interviewer (Hedlund, 1981; Schwartz, 1984). Reasons and means for applying the computer to the task of patient interviewing have been discussed at length by Griest and Klein (1980) and McCullough, Farrell and Longabaugh (in press).

Note: Paper presented at the Evaluation Research Society Annual Meeting, Toronto, October, 1985. For additional information contact John F. Stevenson, Department of Psychology, University of Rhode Island, Kingston, RI 02881.

At Butler Hospital, a moderate-sized private psychiatric hospital affiliated with the Brown University Division of Medicine and Biology, a program of research on problem-oriented record-keeping and treatment has produced a series of computerized patient interviews (Longabaugh, Fowler, Stout, & Kriebel, 1983; Longabaugh, Stout, Kriebel, McCullough, & Bishop, in press; McCullough, Longabaugh, and Stevenson, 1982; Stevenson, McCullough, Longabaugh, and Stout, 1984; Stout, 1983; Stout and McCullough, 1981). These interviews responded to the need for a comprehensive, problem-oriented patient self-report instrument. The programming developed for these interviews allowed patients to sit at a terminal and respond to a lengthy problem list, with branching to avoid irrelevant questions wherever appropriate. A follow-up interview is an important component of the most recent version of the interviews, titled the Major Problem Rating System (MPRS) (McCullough et al, 1982; Stevenson et al, 1984). The followup procedure makes use of a 3-page form to obtain patients' judgement of degree of improvement on those "Major Problems" positively identified during the initial computerized interview.

The MPRS was designed, and has always been used, as one component of a battery of outcome instruments. Furthermore, the interview systems referred to above were not primarily designed to serve as longitudinal monitoring devices. Although the internal structure and administration of these interviews has been made more efficient by computerization, computer technology has not been applied to enhance the efficacy of a frequently readministered data gathering device. The MPRS, though very economical for followup administration, is narrow in the range of information obtained in these administrations. As one part of a battery, it elicits current information only about major problems indicated at baseline, and does not incorporate the broad array of symptoms and social functioning aspects of outcome one might wish to see.

Responding to the need for a cost-effective, multi-dimensional tracking device to monitor psychiatric functioning, we have begun the development of such an instrument. In the remainder of this paper we will briefly describe the structure and content of the interview system, take note of some pilot data collected via the

system, and indicate some promising directions for continuing development.

Multivariate Monitoring System

Working in a psychiatric hospital context, we set out to develop a computerized interview system that would incorporate substantial elements of the Diagnostic Interview Schedule, as well as evidence about social behavior and social supports, instrumental functioning (work, self-care, and residential self-sufficiency), and recent stressful life events. We wanted a system that would manage not just a single interview covering these domains, but a schedule of interviews extending over a lengthy period of time. To do this we drew on our own previously developed software for computer interviewing (Stout, 1983), extensive examination of existing psychiatric outcome measures (Beattie and Stevenson, 1984; McCullough, Jenik-Reney, and Longabaugh, 1984; and Stevenson, 1982), and experience acquired in using our own multi-dimensional outcome questionnaire, the Psychosocial Functioning Inventory (Feragne, Longabaugh, and Stevenson, 1983).

Scale Content. As presently organized, the interview system includes the following content in the order presented (see Table 1).

See Table 1

The initial, or "baseline:, interview begins with a series of demographic items, some of which are also used in assessing social and instrumental functioning. Next, treatment during the previous week (or week prior to admission, if hospitalized at baseline) is recorded. A lengthy portion of the baseline interview covers the following sections of the Diagnostic Interview Schedule (DIS) most relevant for the population of concern to us: depression, mania, schizophrenia, alcohol abuse, and drug abuse. Social functioning is explored in several ways: negative social behaviors, leisure activities, social engagement, and social support. Instrumental functioning is addressed with items regarding employment, self-care, and residential self-sufficiency.

Subsequent, or "followup" interviews cover these same domains, but with a programmed selectivity that greatly reduces the length of the interview. A preliminary

section of the followup interview covers information obtained at baseline, and is completed by the interviewer prior to the beginning the interview with the patient. All subsequent items refer only to the past seven days. Demographic items are prefaced by "Are you still...". A series of areas of potential stress are queried for changes. Treatments are recorded, and there is a brief review of DIS symptoms occurrence for the past seven days. Social and instrumental functioning items are phrased in terms of change from the preceding interview.

Design for Efficient Monitoring. We have considered three means for taking advantage of computerization in a frequently administered monitoring device. First, status on a series of variables is pre-recorded from the preceding interview (e.g. marriage, children, employment, people in support network, drugs used). These variables control administration of various items and sections of the followup interview. Second, some areas of social and instrumental functioning have been conceptualized as ordinal scales. Once a person's level of functioning has been located on the scale, only items implicating change from that level must be presented. Stevenson (1982, 1983a, 1983b) has described this type of scale and provided preliminary evidence of its utility. Third, we anticipate using "dynamic programming" to select some items for followup on a probabilistic basis (Stout, ±985). Our pilot data provide leads for this approach.

Procedures for Administration. A trained interviewer sits at a terminal to conduct the interviews. Training time can be relatively short (2 hours), and previous clinical training is not necessary. The baseline interview takes from 45 to 75 minutes, and calls for the interviewer to enter most responses directly into the computer. Some procedures (e.g. DIS followup questions when a symptom has been reported) make use of a separate guide sheet which can be memorized by the interviewer after several interviews. In two places separate forms are used -- for recording leisure activities and social network. The computer stores quantitative summaries of this information. The followup interview begins with a section completed by the interviewer on the basis of the preceding interview, and then moves quickly through the sections of

the interview. Completion time is 20 minutes, and this interview can easily be conducted by telephone.

Pilot Study Results. Six hospitalized patients with DSM-III diagnoses of schizophrenia were interviewed during their hospitalizations and again one month later. Interviewer and patients found the system clear and straightforward. The DIS guide sheet, and the leisure activities and social network records, served their purpose. The reason for the lengthiest interview appeared to be the patient's wish to prolong the interactions with the interviewer as a social occasion. At followup these patients were interviewed in person during outpatient visits to the hospital and three patients were interviewed by telephone without difficulty. At followup patients also appeared to enjoy the contact as a social intervention.

In addition to "debugging" the program and establishing the practical feasibility of our interview system, we also wished to use the pilot data to examine the pattern of responses. This was particularly important as a preliminary indication of the value of a dynamic programming approach to selecting followup items. If symptoms, negative social behaviors, and so on, that do not occur at baseline never occur at followup, then there is no need to ask about them at followup. If many of them are very likely to emerge at followup, then it is important to consistently track all of those likely to appear. In 44 symptom items draws from the DIS portion of the interview, there were 11 items (25%) for which one or more patients did not report the symptom at baseline, but did report it at followup. In all but one of these instances, only one person fell in this category of potential "false negative." For the seven Negative Social Behavior items, there were three items for which one or more patients did not report the behavior at baseline, but did report it at followup. On the basis of this very limited pilot data, we do see promise for a probalistic item sampling approach in some areas of the followup interview.

The pilot data were also examined to assess the utility of ordinal scales for level of social engagement and instrumental functioning. Although the items could be used for classifying respondents into ordinal categories, it was unclear whether significant savings in interview time would result from this approach. Because the

ordinal scaling approach has other advantages for summarizing level of functioning, we plan to continue to experiment with this method.

The psychometric properties of these scales have not been established. As in the case of many outcome measures in mental health, this will be a challenging task (Ciarlo et al, 1981; Stevenson, 1982).

Applications. This monitoring system was designed to track a series of symptoms and dimensions of functioning most closely associated with the portion of the adult psychiatric population at risk for inpatient hospitalization. Because the initial interview is somewhat lengthy and intended to be conducted face-to-face, it is best administered during an inpatient stay or a regularly scheduled treatment visit. Followup interviews cover 1-week periods and may be administered by telephone -- they could be administered as frequently as every week, but our own use envisions monthly administrations. There are several purposes for this sort of long-term monitoring. Epidemiologists now view temporal patterns as one promising means of distinguishing diagnostic categories (Stout, 1984). Clinician-researchers designing improved treatment program for the chronically mentally ill may look to relapse prediction as an essential tool for relapse prevention, and monitoring may make prediction of relapse possible. Assessment of complex treatment effects as they unfold over time allows a more comprehensive evaluation of completing treatment programs. And finally, systematic tracking can provide a clearer picture of life events and treatments subsequent to an index episode under study.

TABLE I

SCALE CONTENT OF A MULTIVARIATE MONITORING SYSTEM

TITLE	ITEM CONTENT [a]
I. Demographics	Sex, age, marital status, type of residence, children, occupation, days worked, length of time since last worked, education, income, sources of income.
II. Treatment	Sources, amounts, satisfaction with treatment for mental problems, medication, missed medication.
III. DIS Symptoms	
A. Depression	Relevant symptoms, age of onset, duration, with followup questions for DSM-III diagnosis.
B. Mania	Same as above.
C. Schizophrenia	Same as above.
D. Alcohol abuse	Same as above.
E. Drug abuse	Same as above, with detailed history of all drugs used.
IV. Social Functioning	
A. Negative social behavior	Inappropriate/abrasive/disturbing behaviors
B. Leisure activities	Type, amount, satisfaction
C. Social engagement	Structured vs. unstructured activities, degree of self-initiation, sexual involvement.
D. Social support	Number of people and portion of time in supportive and uncomfortable contact.
V. Instrumental Functioning	
A. Vocational	Employment (including student and housework), absences, criticism of work, sufficiency of income, quality, and satisfaction.
B. Self-care	Fulfillment of household responsibilities, self-sufficiency for dressing, eating, bathing.
C. Residential	Type of residential setting, ordered by degree of independence.
VI. Life events	Change for better or worse in income, occupation, marital/romantic involvement, legal problems, physical health, etc.

a. Wherever appropriate, assessed in terms of portion of the past 7 days.

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